FOSSIL ARTHROPODS OF CALIFORNIA
26. THREE NEW FOSSIL INSECT SITES IN CALIFORNIA

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1. An Upper Miocene Weevil Wing from Los Angeles County

It is with pleasure that I add to the well-known fossil insect sources, an entirely new source: a deposit of Altamira shale, of Upper Miocene, disclosed by road excavators on Woodcrest Drive, off Sepulveda Boulevard, Los Angeles County, Recorded as site LACMIP 438. In December 1961, Eric Sorrenson broke a piece of shale and found a weevil elytron and its impression.

This elytron is characterized by deeply punctate striae and strongly resembles the elytra of the genus *Rhyssematus* to which I am tentatively assigning it.

Order Coleoptera
Family Curculionidae (*sens. lat.*)
Subfamily Cryptorhynchinae
Genus *Rhyssematus* Schönherr

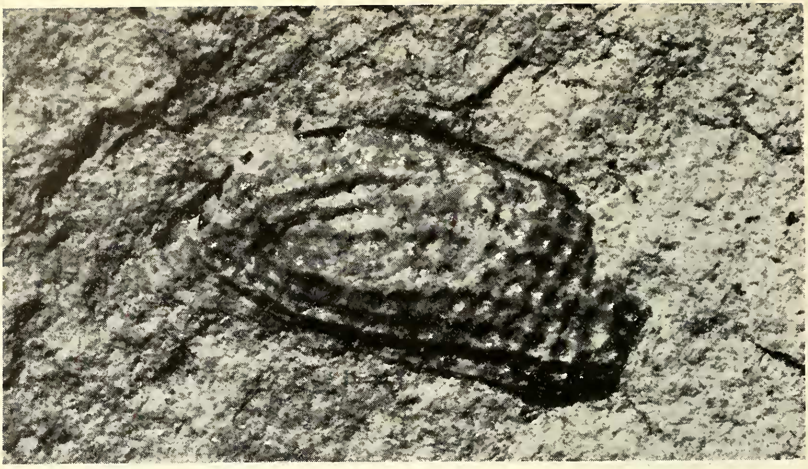
Rhyssematus miocenae, new species, fossil.
Figure 1

Description: Described from fossil elytron and its impression. Registered as type S9112 in Invertebrate Paleontology Collections, Los Angeles County Museum. Color of integument black, but only marginal traces of the original outer surface remain. The subsurface is colored ferruginous.

Length of elytron 5.8 mm.; width 2.2 mm.

The elytral intervals are more or less evenly convex, except that the second and eighth intervals are more elevated, and unite apically. The strial punctures are very large and deep and narrowly separated in the striae.

In this genus the species *parvulus* Casey, *ovalis* Casey, *pruinosus* Boheman, and *aequalis* Horn have the elytral intervals almost equally convex, but these belong to two groups, based on the separation of the eyes, and they differ individually by the prothoracic sculpture. As we do not have any other part, the specimen must be set aside as a probable record of this interesting genus.



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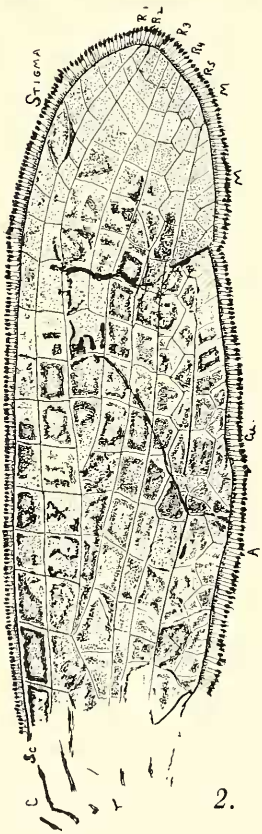

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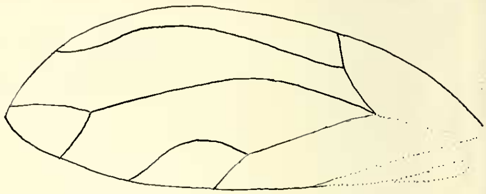

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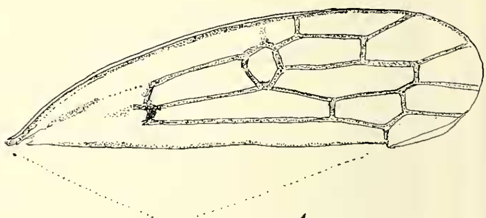

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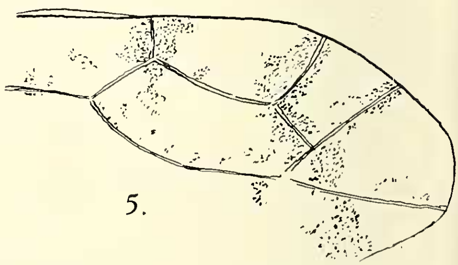

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Figure 1. Outside of weevil elytron in Altamira shale, Upper Miocene, Los Angeles, California. *Rhyssematus miocenae*, new species.

Figure 2. Wing of fossil insect, *Sobobapteron kirkbyae*, new species.

Figure 3. Wing of jumping plant louse, *Trioza sp.*, from submarine core.

Figure 4. Anterior wing, without anal section, of a leaf hopper of the genus *Eutettix*, subgenus *Mesamia*, from submarine core.

Figure 5. Fragment of wing of a membracid leaf hopper from submarine core.

2. A Wing of an Extinct Order of Insects from Riverside County

While California is rich in fossil insects, found in the Pleistocene asphalt deposits, and those enclosed in Miocene lake bed nodules from volcanic mountain areas, few other sources have been put on record.

It is with pleasure that I now add an interesting wing found by Mrs. Ruth Kirkby in Riverside County, on the west side of Gunsight Pass just outside the Soboba Indian Reservation in SW ¼, NW ¼. Section 28, R.I.E., T.4.S., on the San Jacinto SW ¼ Banning 15′ Quadrangle, northeast of San Jacinto, California. The site is recorded as LACMIP 437. It was found in a shale supposed by Dr. D. I. Axelrod to be Pleistocene, but which I believe must be older, nearer Permian.

The rock was split, perfectly dividing the layers of the wing on each piece of the shale, so that what we see is the insides of the wing. However, the pigment pattern and the venation are clearly visible, and enable me to interpret its position in ordinal classification.

A unique feature is that the wing is completely margined by a fringe of clubbed hairs; fringed wings are rare among insects, occurring however throughout Thysanoptera, in Diptera, Psychodidae; and in Embiida. Other features indicate that this wing does not belong to an existing order.

In his volume on the Wings of Insects, Comstock (1918) placed emphasis on the types of branching of the radius. Among the described fossil orders there are two genera:

Hapaloptera in Handlirsch's Order Hapalopteroidea and *Permobiella* in Martynov's Order Caloneurodea which have R_5 separating from R_{2-4}, and R_3 branching from R_2 or from cross veins between R_2 and R_4. Both of these ancient genera belong to the period from Carboniferous (Pennsylvanian) to Permian. Carpenter groups *Hapaloptera* with the Protorthoptera, and places Caloneurodea next to it. In no modern order does this type of radius appear. Hence the finding of this type of radius in our specimen indicates ancient origin.

Our new wing differs from these two genera in the fact that the subcosta is the marginal vein, not costa; but agrees in the elongate narrow shape without emphasis of an anal area. It is probably a forewing.

I therefore tentatively place the wing in the generalized Order Protorthoptera of Handlirsch, superfamily Hapalopteroidea Handlirsch, and believe that the rock is older than Pleistocene.

Order PROTORTHOPTERA Handlirsch
Superfamily HAPALOPTEROIDEA Handlirsch
Genus **Sobobapteron,** new genus

Sobobapteron kirkbyae, new species, fossil.
FIGURE 2

DESCRIPTION: Described from a wing in two pieces, upper and lower surfaces on two slabs of shale, numbered as type S9113 in the Los Angeles County Museum Invertebrate Paleontology series, found by Mrs. Ruth Kirkby, in whose honor it is named.

Size of wing 13x3.75 mm.

An elongate fossil wing split between upper and lower surfaces on a small slab of shale, probably a mesothoracic wing. Outer margin fringed, with clubbed hairs on entire periphery (a new ordinal character).

On one piece there is indication that there may have been a brief basal costal area. Otherwise the subcosta is the marginal vein to apex. Radius is parallel from base to apex where it joints the subcosta, and the two veins are separated by 18 cross veins, forming oblong cells. The 14th and 15th cross veins are diagonal and strongly emphasized and form a stigma, a character present in the forewings of only a few orders. The base of radial sector is connected with radius by a cross vein before basal fourth of wing, at which point it divides into R_{2-4}, and R_5. A little before middle of wing R_{2-4} splits into R_{2+3} and R_4. These are joined by three cross veins, the third angled and giving rise to R_3. Seven cross veins cross R_3 and unite it with R_2 and R_4 forming quadrate cells.

In this last character the genus is separable from *Hapaloptera* and *Permobiella.*

The entire wing is divided by cross veins into quadrate cells, except in the anal and apical portions where the cells are often pentagonal. The last series of cross veins in the radial area give rise to additional longitudinal veins and from R_1 to Media there are eight small longitudinal apical cells. M_1 is complete from base to apex, but M_2 extends as a straight line only to basal third, beyond which it is a zigzag vein. One cubital vein is more or less complete. But beyond this the cubital-anal area is filled with irregular cells. There is only a slight widening for anal area at basal third.

3. RECOVERY OF INSECT WINGS FROM OCEAN BASIN CORES

In parts 2 and 3, I presented two new sources of fossil insect wings from the land, but now Carol Jean Bumgardner, formerly of the Scripps Institute of Oceanography and now of the Los Angeles County Museum, adds an entirely new source for insect fossil material; the underwater cores of oceanic deposits.

From the central region of Santa Barbara Basin at 600 meters depth, cores were taken by Andrew Soutar of the Institute down to 56 cm. below the surface, with age of the material 100 to 150 years. The site is recorded as LACMIB 439. From these cores Miss Bumgardner has delicately removed several fragments of insect wings found among fish scales and bones.

It is of course not infrequent that insect wings are carried on the wind from land to sea; and we also know that insects caught by birds, and probably fish, have the wings cut off and cast aside, because they are impalatable. So it is natural that many insect wings should settle to the bottom. But this is the first time that they have actually been found in the bottom deposits of oceanic waters in original unfossilized condition.

The four wings before me are 100-150 years old, and it is to be hoped that deeper cores will yield older material, because Miss Bumgardner says some of the core material already taken is 1,000 years old.

From Santa Barbara Basin Core No. 1, taken in the Central Region of Santa Barbara Basin at 120°03′W, 34°15′N at 600 meters depth, slide (A) taken 10 inches below the surface of the core, contained a pair of wings of a jumping plant louse, order Chermodea, family Chermidae, probably belonging to the genus *Trioza*, (Figure 3). The bases of both wings are broken and the costal veins out of position, with another basal vein in distorted position, but the pattern is that of *Trioza*. Specimen S9133 in Los Angeles County Museum Collections in Invertebrate Paleontology.

From Santa Barbara Basin Core No. 2, taken in the same region but without depth data, is an anterior wing (Figure 4), minus its anal region, of a leaf hopper, Homoptera, family Jassidae, subfamily Jassinae, which is close to the genus *Eutettix*, having all the cells as in *Eutettix (Mesamia) cincta* Osborn and Ball, but not the markings. Although that species has a wide range, it does not occur in the west. Specimen S9134 in the Los Angeles County Museum Collections in Invertebrate Paleontology.

From Santa Barbara Basin Core No. 3, taken in the same region, 56 cm. below the surface, and possibly 100-150 years old, is the tip of an anterior wing (Figure 5), which is probably that of a leaf hopper, order Homoptera, family Membracidae. Only five terminal cells are present. Specimen S9135 in the Los Angeles County Museum Collections in Invertebrate Paleontology. The specimens were from laminated undisturbed sediments but not from the same stratigraphic layer.

Literature Cited

COMSTOCK, J. H.
1918. *The wings of insects.* Ithaca, New York: Comstock Publ. Co.